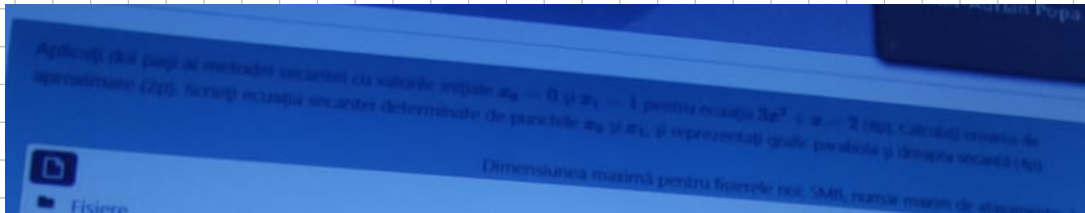# Metoda secantei

x_0, x_1 = valorile inițiale

$x_{i+1} = x_i - \frac{f(x_i)(x_i - x_{i-1})}{f(x_i) - f(x_{i-1})}$ **for** $i = 1, 2, 3, \ldots$

$l_{i+1} \simeq \left| \frac{f''(r)}{2f'(r)} \right| l_i \, l_{i-1} \quad \Rightarrow$ convergență superliniară

$\Rightarrow l_{i+1} \simeq \left| \frac{f''(r)}{2f'(r)} \right|^{\alpha - 1} l_i^{\alpha} \qquad \alpha \simeq 1,62 = \left(\frac{1 + \sqrt{5}}{2} \right)$

$x_0 = 0 \qquad l_0 = |0 - \frac{2}{3}| = \frac{2}{3} \qquad$ eroare?

$x_1 = 1 \qquad l_1 = |1 - \frac{2}{3}| = \frac{1}{3} \qquad$ ec. secantei dreptei + G_f + $G_{sec.}$

$f(x) = 3x^2 + x - 2$

$x_{i+1} = x_i - \frac{(3x_i^2 + x_i - 2)(x_i - x_{i-1})}{3x_i^2 + x_i - (3x_{i-1}^2 + x_{i-1})} \qquad \Delta = 1 + 24 = 25$

$x_{1,2} \to \frac{2}{3}$

$x_2 = \frac{1}{2} = 0,5 \qquad l_2 = |\frac{1}{2} - \frac{2}{3}| = \frac{1}{6} = 0,167 \quad l_2 \simeq \left| \frac{6}{10} \right| \cdot \frac{1}{3} \cdot \frac{2}{3} = \frac{2}{15} = 0,133$

$x_3 = \frac{7}{11} = 0,63 \qquad l_3 = |\frac{7}{11} - \frac{2}{3}| = \frac{1}{33} \qquad l_3 \simeq \frac{3}{5} \cdot \frac{1}{6} \cdot \frac{1}{3} = \frac{1}{30} = \frac{0,1}{3}$

$f'(x) = 6x + 1 \qquad \to f'\left(\frac{2}{3}\right) = 5$
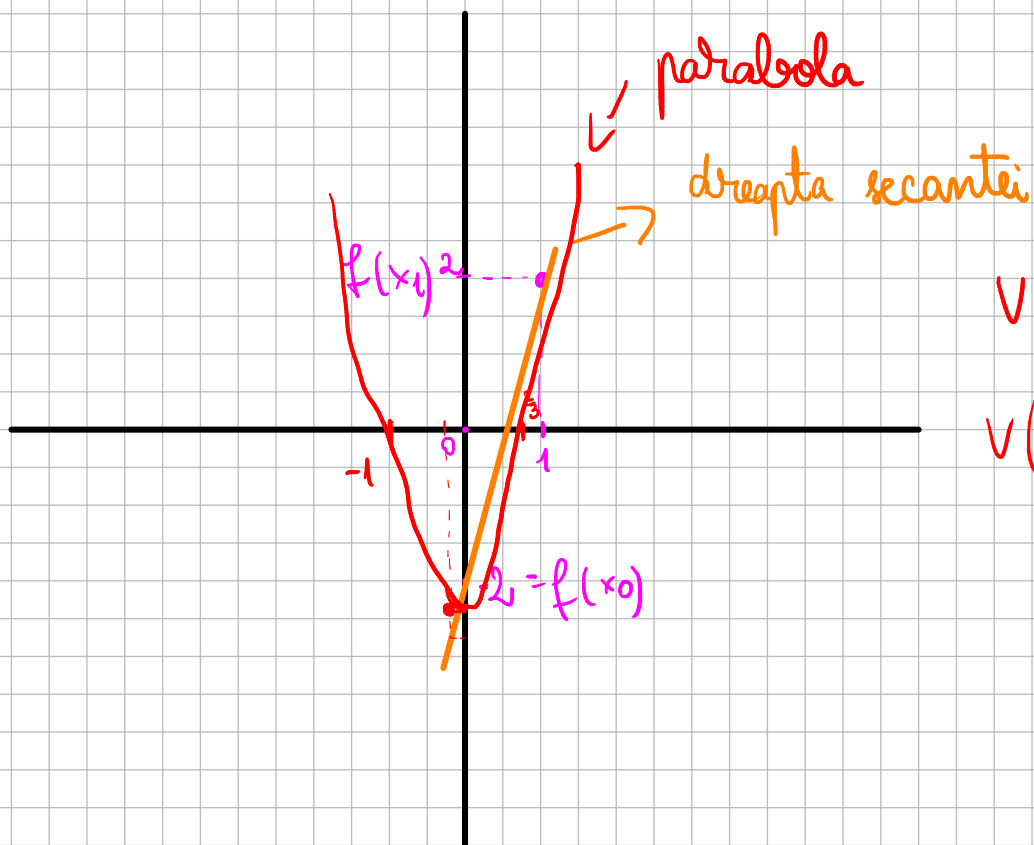
$f''(x) = 6 \qquad \to f''\left(\frac{2}{3}\right) = 6$

pt. ec. secantei:

$y - y_0 = m(x - x_0) \, , \quad m = \frac{f(x_1) - f(x_0)}{x_1 - x_0} = 4$

$x_0 = 0$

$y - f(x_0) = 4(x - 0)$

$y + 2 = 4x \quad \Rightarrow \quad$ secantă: $4x - y - 2 = 0$

parabola

dreapta secantei

$f(x_1)$ 2

3

1

-1

0

2 = $f(x_0)$

$V\left(-\dfrac{b}{2a} \; ; \; -\dfrac{\Delta}{4a}\right)$

$V\left(-\dfrac{1}{6} \; , \; -\dfrac{25}{12}\right)$